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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/650,878	08/30/2000	Chris S. Brunt		2147

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EXAMINER

RO, BENTSU

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 04/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/650,878	BRUNT ET AL.
Examiner	Art Unit	
Bentsu Ro	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

1)  Responsive to communication(s) filed on 7/7/02 & 2/4/03.

2a)  This action is **FINAL**.                    2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-4 and 7-15 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) 11 is/are allowed.

6)  Claim(s) 1-3,8-10,12,14 and 15 is/are rejected.

7)  Claim(s) 4,7 and 13 is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)  The proposed drawing correction filed on \_\_\_\_\_ is: a)  approved b)  disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)  The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)  All b)  Some \* c)  None of:

1.  Certified copies of the priority documents have been received.
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a)  The translation of the foreign language provisional application has been received.

15)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)      4)  Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_ .  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)      5)  Notice of Informal Patent Application (PTO-152)  
3)  Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.      6)  Other: \_\_\_\_\_ .

## SECOND OFFICE ACTION --- A FINAL REJECTION

1. Claims 1-3, 8-10, 14, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ramarathnam US Patent No. 6,316,895 B1** in view of **Joyner, Jr. et al US Patent No. 4,308,491**. (These two are new references.)

Ramarathnam teaches a variable voltage variable frequency (VVVF) sinusoidal waveform for powering an ac motor. Ramarathnam does not teach the use of motor to a pump, however, a pump system requiring a variable speed ac motor is taught by Joyner. In view of Joyner's teaching, it would have been obvious to a skilled person in the art to use Ramarathnam's motor to run Joyner's pump system to achieve the same subject matter as claimed.

The following chart compares the claimed subject matter with Ramarathnam's teaching.

### The claims:

Claim 1. (Amended) An apparatus for providing a variable flow of liquid, comprising:

a controller for varying the flow rate

of an AC permanent magnet synchronous motor pump

in accordance with AC pulse switching signals applied to said motor pump;

a programmable micro-controller incorporated into said controller,

### Ramarathnam's teaching:

Ramarathnam's motor to run Joyner's pump will achieve a variable flow of liquid;

same above;  
Ramarathnam Fig. 1 teaches a general schematic of the motor system, which schematic is a controller;

Ramarathnam's motor can be several different types, including a synchronous AC motor, see col. 3, lines 33-35;  
it is noted that all synchronous AC motors or synchronous DC brushless motors have permanent magnet rotors;

Fig. 4 shows the AC pulse switching signals;

Fig. 1 shows a micro controller unit 5;

comprising means calculating in a related manner both the pulse width and frequency of said AC pulse switching signal for synchronously controlling said motor pump over an extended range of flow rates; and

an output switching circuit incorporated into said controller,

comprising means generating an AC pulse waveform for driving said motor pump according to said AC pulse switching signals.

Claim 2. (Amended) The apparatus of claim 1 further comprising an AC permanent-magnet synchronous motor pump for providing an output flow of liquid.

Claim 3. (Amended) The apparatus of claim 2, further comprising a rotor and impeller assembly....

Claim 8. (Amended) The apparatus of claim 1, further comprising a line receiver/transmitter for interfacing an external data input/output signal to said micro-controller.

Fig. 9 shows a step “compute V, F & Ts for that speed, if set speed is changed”; wherein V=voltage, F=frequency and Ts=PWM period;

Fig. 1 shows a PWM inverter 2;

Fig. 2b shows the transistors Q1-Q6.

Ramarathnam's motor is an AC permanent-magnet synchronous motor as explained previously; using Ramarathnam's motor to run Joyner's pump will output an flow of liquid.

The impeller, the rotor, the coupling, etc are all prior art; if one disassembles a pump/motor system, he will immediately see a motor rotor shaft coupled to an impeller shaft via a screw coupler, a screw coupler is a hallow shaft such that motor shaft can be inserted in one side and the impeller shaft can be inserted in another side, the hallow shaft has two screws, each for fixing and holding the motor shaft and the impeller shaft, respectively.

Fig. 9 shows a step “read set speed”.

Claim 9. (Amended) the apparatus of claim 1, further comprising rectifier circuitry for converting alternating current to direct current for driving said microcontroller and said switching circuit.

Fig. 1 shows a rectifier and filter 1, the rectifier 1 provides power to the inverter 2; Fig. 1 does not show the rectifier 1 for providing power to the microcontroller 5, instead, Fig. 1 shows a separate auxiliary power supply 6 for providing power to the microcontroller 5; however, using a single rectifier or two rectifiers depends on the input voltage of the motor and the input voltage of the microcontroller, if both inputs have the same voltage, a single rectifier can be used, or otherwise, two rectifiers can be used; thus, this difference is simply a different design choice.

Claim 10 (Amended) The apparatus of claim 1, further comprising software program embedded in said micro-controller for controlling the behavior of said motor pump.

Fig. 9 shows a flow-chart program.

Claim 14.

Basically same as that of claim 1; the variable voltage and the variable frequency ac signal is clearly shown in col. 1, lines 39-40, 59-61; col. 3, lines 25-26, 43, 55-56, etc.

Claim 15.

A very broad claim having the same variable voltage and variable frequency ac signals of claim 14.

2. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramarathnam in view of Slate et al US Patent No. 4,919,596. (The Slate reference was cited used by the examiner in the first office action.)

Regarding claim 12, Ramarathnam does not teach a fountain system. However, a fountain system is taught by Slate. Because Slate's fountain system requires a motor driver (Fig. 5, element 80), it would have been obvious to a skilled person to use Ramarathnam's motor to run the fountain system of Slate to achieve the same subject matter as claimed. Other variations, if any, are considered obvious to a skilled person in the art.

3. Claim 11 is allowable.
4. Claims 4, 7 and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In rewriting these claims, applicant should be careful not to claim the same subject matter twice because the subject matter of claim 4 has already incorporated into claim 11.

5. Applicant's arguments with respect to claims 1, 2, 3, 8, etc. have been considered but are moot in view of the new ground(s) of rejection.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CAR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CAR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication should be directed to Bentsu Ro at telephone number 703 308-3656.

April 5, 2003

  
Bentsu Ro  
Primary Examiner